United States Patent [19]

Baxter

[11] **3,887,085**

[45] **June 3, 1975**

[54] **PREFABRICATED HOUSE MODULE MOVING SYSTEM**

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[73] Assignee: **The Binkley Company**, Warrenton, Mo.

[22] Filed: **Dec. 5, 1973**

[21] Appl. No.: **421,758**

Related U.S. Application Data

[62] Division of Ser. No. 216,204, Jan. 7, 1972, Pat. No. 3,794,186.

[52] **U.S. Cl.** ..... **214/1 H**; 238/13

[51] **Int. Cl.** **B65g 67/24**

[58] **Field of Search** ..... 214/1 H, 38 BA, 515, 517, 214/152, 38 B; 238/13; 105/366 R, 368 B, 178; 52/122, 745; 104/48

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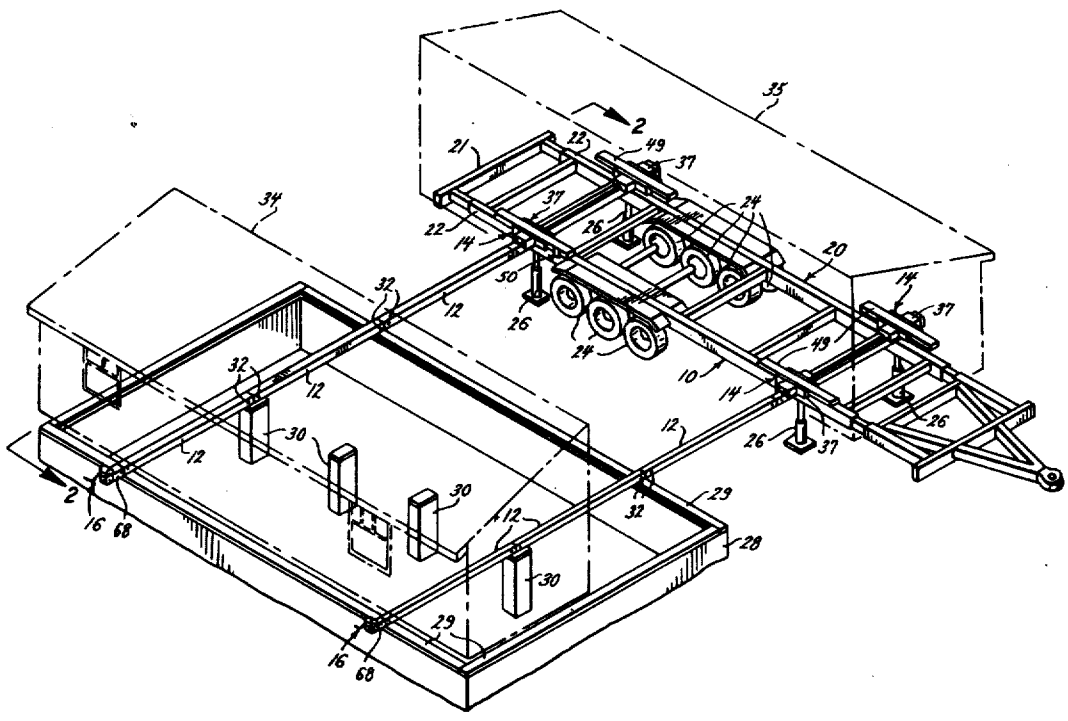
Primary Examiner—Frank E. Werner

Attorney, Agent, or Firm—Rogers, Ezell & Eilers

[57] **ABSTRACT**

This is a novel prefabricated house module moving system, a novel method of effecting same, and novel operating units thereof. The novel system includes a tractor-drawn, lengthwise adjustable transporter or trailer of chassis-type construction for moving house modules and the like from a fabrication center to a house foundation. At the foundation site two parallel roller tracks of connected segments are disposed under the first house module on the transporter between the transporter and a foundation for the house, and across the house foundation. Novel four-way roller pads are placed under the house module on the tracks which receive the house module for movement from the transporter to the house foundation under a lateral winching action. When in position above the foundation, the module is centered through maneuvering of the four-way movable adjustable pads, the module is jacked up and the roller pads are rolled from beneath it and beneath a second house module on a transporter which has been moved into place beside the foundation. The second module is similarly moved onto the foundation, centered, and jacked up. The track and rollers are moved from beneath both modules and the two units are lowered onto the foundation.

7 Claims, 9 Drawing Figures



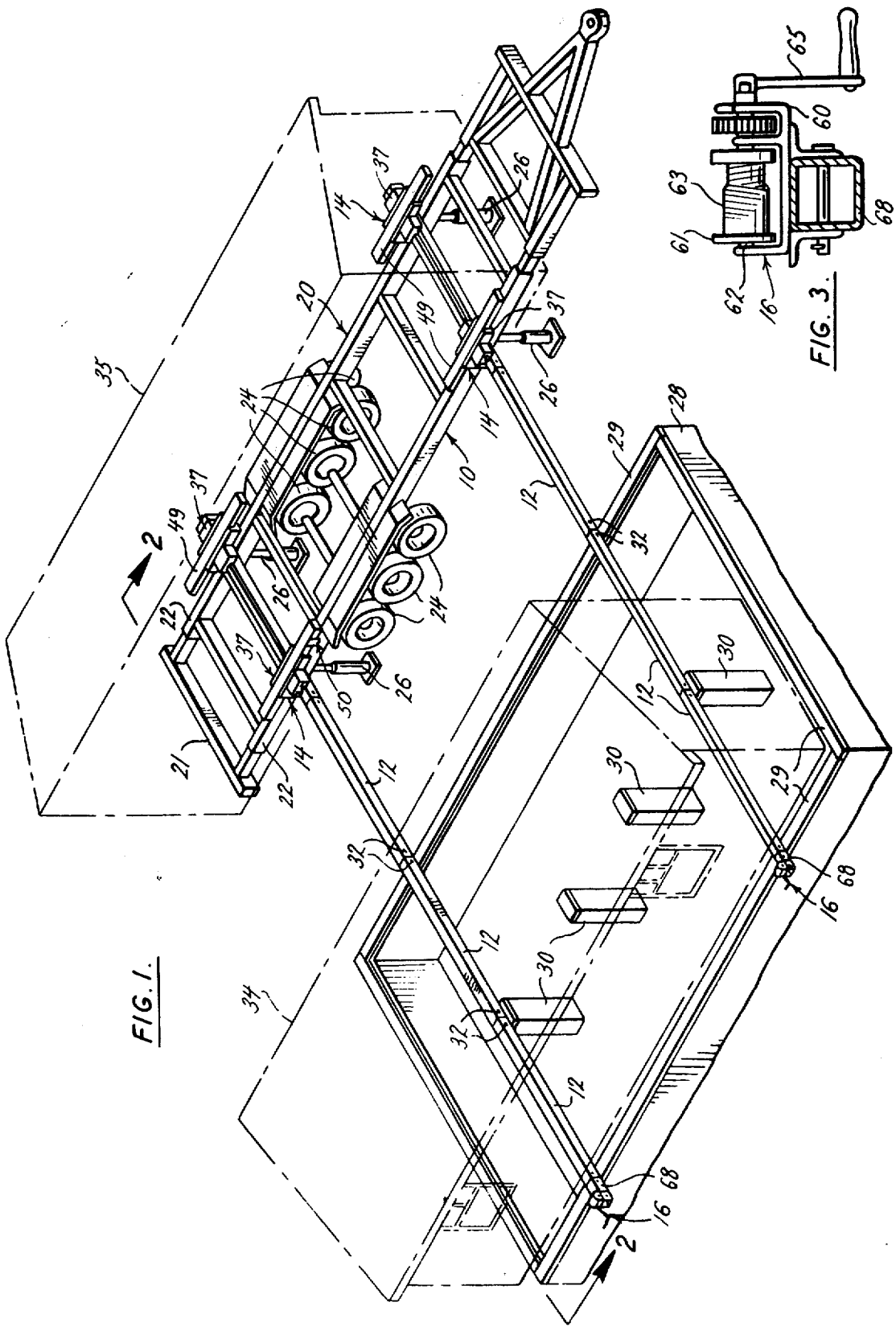

35
20
37
14
26
49
24
10
12
28
29
32
30
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34
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68
2

FIG. 1.

65
60
63
61
68
62
16

FIG. 3.

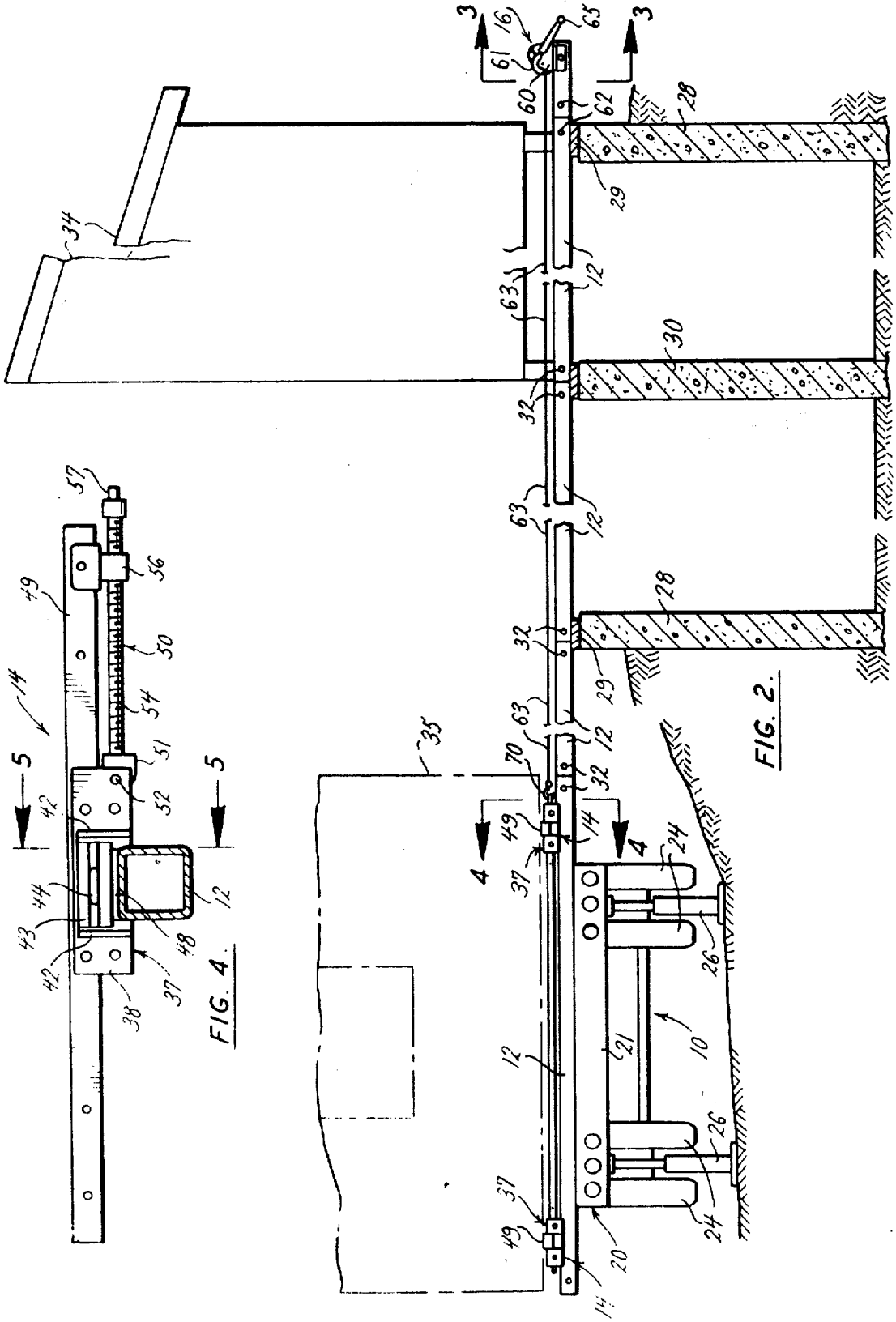

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12
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FIG. 2.

FIG. 4.

FIG. 5.

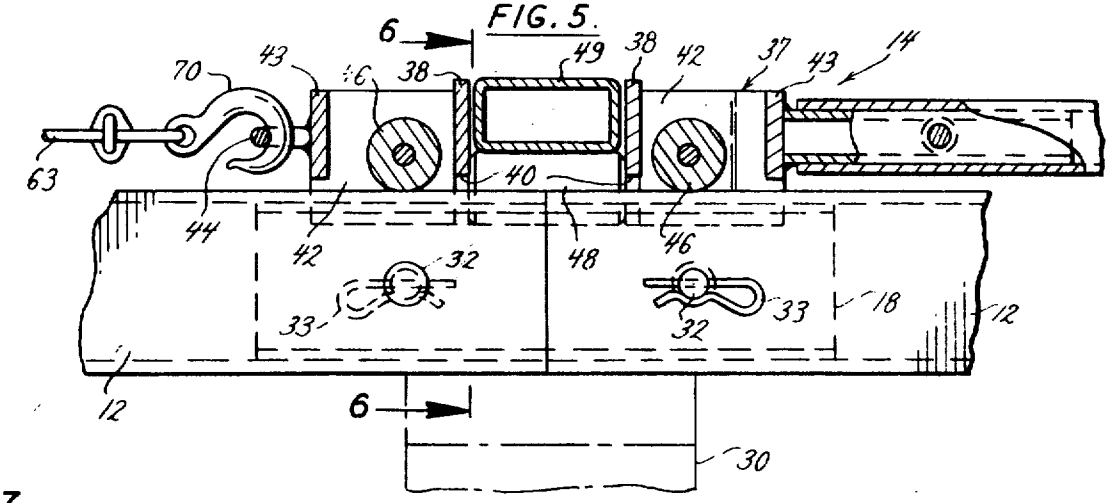


FIG. 6.

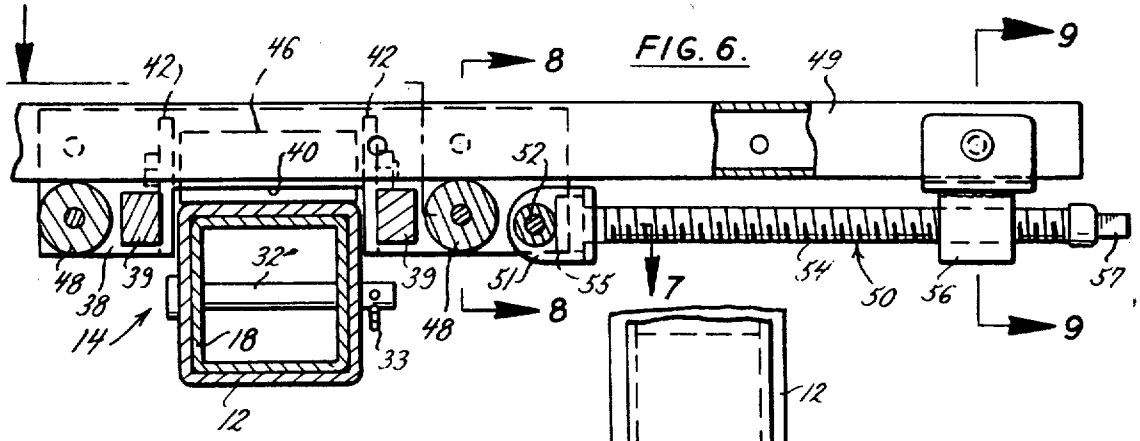


FIG. 9.

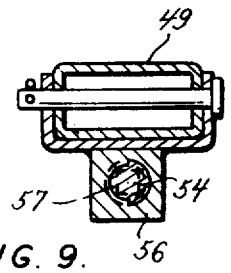


FIG. 7.

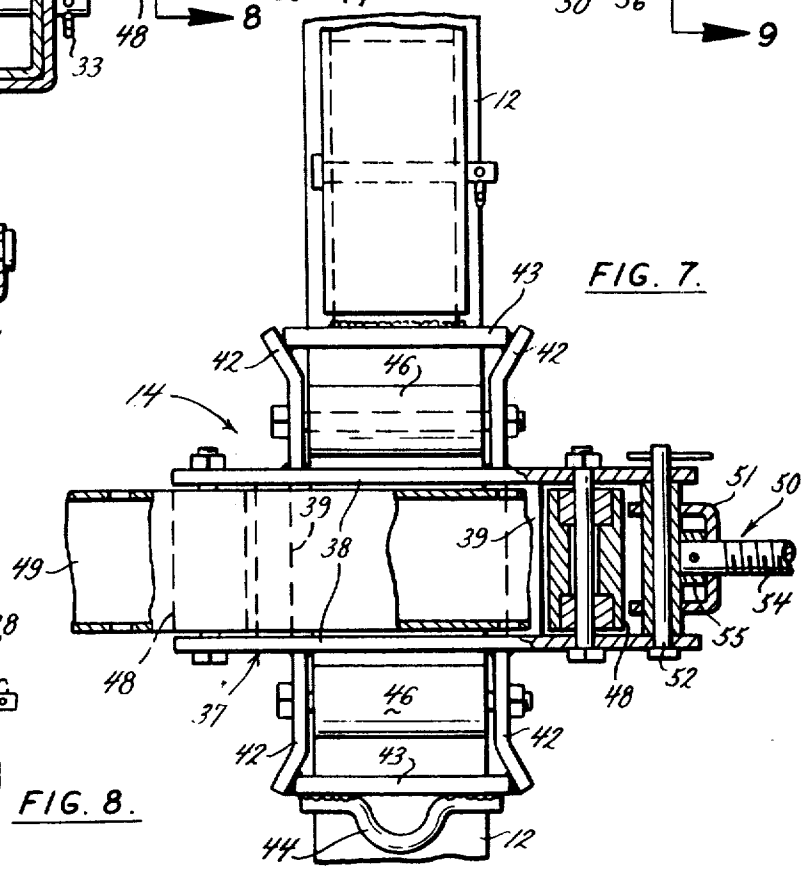
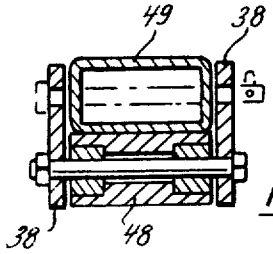


FIG. 8.



PREFABRICATED HOUSE MODULE MOVING SYSTEM

This is a division of application Ser. No. 216,204 filed Jan. 7, 1972, now Pat. No. 3,794,186.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to the building arts and more particularly to a novel system and method of transporting house modules and the like and placing them in precision manner on foundations, and to novel units of the system.

2. Description of the Prior Art

Heretofore, of course, house modules have been moved by tractor trailers from fabrication point to foundation, and various means have been employed to move the module onto the foundation and to align the same. Greasy wooden blocks placed on the foundation in areas of the corners of the module have long constituted the usual method of aligning a house module and the like on a foundation, but this requires a number of men, much time is consumed, often there is serious damage to the module, and precision results are seldom obtained. Thus, there has long existed the need of a simple, fast, direct, less expensive method and system of moving a house module and the like from a point of fabrication or the like to and onto a foundation in undamaged precision adjusted squared position employing a maximum of two men. The present invention is a positive and practical answer to the long-existing need.

SUMMARY OF THE INVENTION

In brief and in general, the present novel system includes an adjustable skeleton-type module transporter, connectible track segments adapted to extend from beneath a module on a transporter to and across a foundation which the module will occupy, novel four-way adjustment roller pads adapted to roll on the track and to supportingly receive the module, and a winching structure for each track length for pulling the module from the transporter to the foundation through the medium of the four-way roller pads. The novel method employs the parts and units of the novel system, as is more clearly included below. The novel four-way roller pad includes a pair of tandem rollers which ride upon the track, a pair of tandem rollers mounted at right angles to the first pair receiving a short roller track segment on which the module rests. One such roller pad includes an adjustment assembly for movement of the roller track segment transversely of the main track for aligning the module in respect to its foundation prior to lowering the same into position.

Objects of the present invention are to provide a novel system and method of moving structural modules from some point of fabrication to and onto a foundation in precision aligned relation therewith which can be quickly and efficiently accomplished by two men, which is economical, and which achieves the objects sought without damage to the module.

Further objects are to provide a four-way adjustable roller pad adapted to support a structural module and the like for movement along a track from a transporter or the like to the module's foundation, the pad being adjustable for precision location of the module in position above its foundation, and which otherwise fulfills the objects and advantages sought.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is an isometric view of a prefabricated house foundation and an aligned transporter showing the parts of the novel system by means of which the novel method is accomplished, one module of the prefabricated house adapted to be mounted on the foundation being shown in broken lines thereon and the other module thereof being shown in broken lines on the transporter;

FIG. **2** is a vertical transverse cross-sectional view taken on substantially the line **2—2** of FIG. **1**;

FIG. **3** is a vertical cross-sectional view taken on substantially the line **3—3** of FIG. **2**;

FIG. **4** is an enlarged vertical cross-sectional view taken on substantially the line **4—4** of FIG. **2**;

FIG. **5** is a further enlarged cross-sectional view taken on substantially the line **5—5** of FIG. **4**;

FIG. **6** is a vertical cross-sectional view taken on substantially the line **6—6** of FIG. **5**;

FIG. **7** is a further enlarged horizontal cross-sectional view taken on substantially the line **7—7** of FIG. **6**; and

FIGS. **8** and **9** are vertical cross-sectional views taken on substantially the lines **8—8** and **9—9**, respectively, of FIG. **6**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings more particularly by reference numerals, there are illustrated a tractor-drawn transporter generally designated by the reference numeral **10**, roller track segments **12** of square cross section, four four-way adjustment roller pads **14**, two winch assemblies **16**, and track connectors **18** of square cross section, all constructed in accordance with the teachings of the present invention.

The transporter **10** is of skeletonized construction and includes an elongated frame **20** which is extensible by virtue of a tail unit **21** which telescopes into longitudinal frame members **22** and is locked into selected position by any well-known latching unit such as a bolt, pin, or the like. Three axles, each with two pairs of dual wheels **24**, support the transporter **10**, the number of wheels employed depending on the requirements weightwise. Four hydraulic lift pads **26** are mounted upon the transporter **10** which incorporate hydraulic lines (not shown) connected to suitable power means such as, for example, power means actuated by the engine of a tractor employed to pull the transporter **10**, which is conventional equipment.

With particular reference to FIG. **1**, two spaced parallel articulated links of roller track segments **12** extend across the elongated transporter frame **20**, span the space between the transporter **10** and a prefabricated house foundation **28**, and extend across the longitudinal walls of the foundation **28**, resting upon a cap **29**, being supported between the longitudinal walls of the foundation **28** by a center support **30**. The track connectors **18** telescope into abutting track segments **12** and are removably secured in position by clevis pins **32** and retaining cotter pins **33** (FIGS. **1** and **5** through **7**).

Again referring to FIG. **1**, the four four-way roller pads **14** are shown mounted on the two links of articulated track segments **12** supporting a second module **35** of a prefabricated house, the first module **34** thereof being shown in precision aligned position on the said

parallel articulated roller track segments **12** awaiting final positioning on the cap **29.**

Each four-way roller pad **14** includes a fabricated body **37** incorporating parallel side plates **38** which are spaced apart and held together by two longitudinally spaced bars **39** welded thereto (FIGS. **4** through **9**). Each plate **38** includes a central notch **40** in the lower edge thereof to permit straddling of the roller track segments **12.** A pair of spaced flared guide plates **42** is welded to each plate **38** in tandem relation, a reinforcing end plate **43** being welded to the flared ends of each pair of guide plates **42.** A pull-loop **44** is welded to one plate **43.** Rotatably mounted between each pair of plates **42** is a roller assembly **46** which rides on the track segments **12,** the plates **42** extending below the roller assemblies **46** to engage the sides of the track segments **12** to guide the four-way roller pad **14** in its movement. Rotatably mounted between the side plates **38** are two spaced roller assemblies **48** on which is disposed a roller track segment **49** for axial adjustment transversely of the links of roller track segments **12.**

An adjustment assembly **50** is provided on one of the roller pads **14** for axially moving its roller track segment **49,** which assembly **50** includes a yoke assembly **51** pivotally mounted on a clevis pin **52** supported by and between the plates **38** adjacent one roller assembly **48.** One end of a rotatable screw shaft **54** extends through an aperture in a yoke element of the yoke assembly **51** and is maintained against withdrawal by a collar **55** secured thereto. Secured near one end of the track segment **49** is a screw rider unit **56** which threadedly receives the screw shaft **54.** The other end of the screw shaft **54** is formed at **57** to receive a ratchet tool for selectively rotating the screw shaft **54** to axially move the track segment **49** and a house module thereon.

Hence, the one roller pad **14** having the adjustment assembly **50** has its roller track segment **49** fixed for a particular setting of the screw shaft **54** to effectively fix the transverse position of the module resting thereon in relation to that roller pad. However, the roller track segments **49** of the other three roller pads are free to adjust transversely to variations in spacing between the track segments **12** as the modules are moved thereover.

Each winch assembly **16** is of conventional construction. Referring to FIGS. **1** through **3,** the winch assembly **16** includes a U-shaped base **60** supporting a cable drum **61** by a rotatable shaft **62.** A cable **63** is wound on the drum **61.** A handle **65** is removably connected to one end of the shaft **62.** A suitable lock (not shown) of a type commonly known in the art is provided to hold the drum **61** against reverse winding against tension on the cable **63** upon release of the handle **65.** The winch assembly **16** is bolted to a winch support **68** which is of the same square cross section as the roller track segments **12,** and which is mounted in abutting relation to a roller track segment **12** by means of a track connector **18** and clevis pins **32.** The free end of the cable **63** is secured to a hook **70,** which engages the pull-hook **44** (FIG. **5**).

OPERATION

The present novel prefabricated house module system, the present novel method of precision locating a house module on a foundation, and the novel four-way adjustment pad or assembly are clear from the foregoing description taken with the accompanying drawings. It is manifest that with the present invention, two men can move a house module from point of fabrication to and onto a house foundation in accurate placement quickly and without damage to house module or foundation.

A transporter **10,** with the first module **34** mounted thereon, is positioned generally parallel to the module foundation as shown in FIG. **1.** It is one of the novel features of this invention that this paralleling need not be exact making installation much easier and less time consuming. With the module **34** in position on the transporter, the track segments **12** and the roller pads **14** are positioned as shown between the module and the transporter. One way to do this is to lower the jacks **26** to lift both the transporter and module. Blocks or the like are then inserted between the ground and the module, and the jacks lowered to separate the transporter from the module so that track segments **12** and roller pads **14** can be positioned therebetween. With track and pads in place, the transporter is again lifted with the jacks **26** to again support the module so that the blocks can be removed. When the transporter is lifted the second time, it is made generally level with the top of the foundation. Next, the other track segments **12** are positioned between the transporter and foundation and across the foundation to provide a generally parallel track.

It does not matter where the roller pad **14** having the adjustment assembly **50** is positioned, but it is preferable to position it so that it will be near an outside wall of the foundation after the module is in place for easy access in making final adjustments.

By using the winch assemblies **16** the first module **34** is pulled over the track segments **12** and positioned with its long outside wall aligned with the wall of the foundation.

It is one of the primary features of this invention that the track segments **12** need not be exactly parallel making precise measurements unnecessary. In fact, the tracks can be aligned by simply eyeballing. Any misalignment is compensated by the four-way roller pads **14.** As heretofore described, the roller track segment **49** of the roller pad **14** having the adjustable assembly **50** remains fixed for a given position of the screw shaft **54,** which effectively fixes the transverse position of that portion of the module **34** resting thereon with respect to the track **12.** However, as the module moves over the track on the roller pads, the other three pads, each having a roller track segment **49** which is free to move transversely on the rollers **48** with respect to the roller pad body **37,** automatically adjust for variations in track alignment thereby preventing any binding between the roller pads and the tracks and making it extremely easy to move the module over the tracks. In automatically making this adjustment the roller track segments **49** of the other three roller pads remain fixed with respect to the module since the module is resting thereon, but as the distance between the spaced segments of the track varies, the roller pad bodies **37,** which are adapted to move along the rails **12,** are also allowed to move back or forth as necessary with respect to the roller track segments **49.**

With the long outside wall of the module **34** aligned with the outside wall of the foundation, the side walls of the module are aligned with the side walls of the foundation by adjusting the screw shaft **54.** Thus, by adjustment of the screw shaft **54** and operation of the

winches **16** precise alignment can be achieved between the module and the foundation.

With the module in proper alignment, the module is jacked up, the roller pads **14** and track segments **12** under the module removed, and the module lowered onto the foundation. The second module **35** is similarly placed on the foundation.

It is obvious that a novel system, method and units of the former have been devised which fulfill the objects and advantages sought therefor.

It is to be understood that the foregoing description and the accompanying drawings have been given by way of illustration and example. It is also to be understood that substitution of equivalent elements or steps and rearrangement of steps, which will be readily apparent to one skilled in the art, are contemplated as within the scope of the present invention, which is limited only by the claims which follow.

What is claimed is:

1. A roller pad for use in a system for moving a module unit over tracks and onto a site foundation comprising a body portion, first roller means for supporting the body portion for movement along a track, a roller track segment, second roller means for supporting the roller track segment on the body portion for transverse movement of the roller track segment relative to the track, the roller track segment adapted for supporting a portion of the module thereon, and adjustable means for securing the roller track segment in a selected fixed transverse position relative to the track, whereby the roller track segment is adjustable transversely relative to the track to a selected fixed transverse position.

2. The roller pad of claim **1** including guide means for holding the body portion on the track and for holding the roller track segment on the body portion.

3. The roller pad of claim **1** wherein the adjustable securing means further comprises a lead screw, means for mounting the lead screw at one end to the body portion for rotation about its longitudinal axis, and a screw rider fixedly secured to the track segment, the screw rider threadedly receiving the lead screw.

4. A roller pad for use in a system for moving a module unit over tracks and onto a site foundation comprising a body portion having first and second pairs of spaced, generally parallel, plates, the second pair of plates being oriented normally to the first pair, first roller means rotatably mounted between the first pair of plates for supporting the body portion for movement along a track, a roller track segment, and second roller means rotatably mounted between the second pair of plates for supporting the roller track segment on the body portion for transverse movement of the roller track segment relative to the track, the roller track segment adapted for supporting a portion of the module thereon.

5. The roller pad of claim **4** wherein the first pair of plates has portions extending below the lower surface of the first roller means on opposite sides thereof, and the second pair of plates has portions extending above the upper surface of the second roller means on opposite sides thereof.

6. The roller pad of claim **4** further comprising adjustable means for securing the roller track segment in a selected fixed transverse position relative to the track, whereby the roller track segment is adjustable transversely relative to the track to a selected fixed transverse position.

7. The roller pad of claim **6** wherein the adjustable securing means further comprises a lead screw, means for mounting the lead screw at one end to the body portion for rotation about its longitudinal axis, and a screw rider fixedly secured to the track segment, the screw rider threadedly receiving the lead screw.

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